

## 13.2 GROWTH AND CHANGING NEEDS

**OBJECTIVES**

- *Identify factors that affect the size of a population.*
- *Compare and contrast population growth trends in developing and industrialized nations.*

Many environmentalists believe that overpopulation is one of the most serious problems we currently face. According to this view, many other significant environmental problems may never be resolved unless worldwide population growth is slowed and ultimately reaches a replacement rate of zero.

### Measuring Growth Rate

Determining the rate of population growth is helpful for scientists, urban planners, and others who have to anticipate the needs of the population of the future. Growth rates are determined by subtracting the death rate (number of deaths per one thousand people) from the birth rate (number of births per one thousand people). For example, in recent years the birth rate in Egypt has averaged 29 births per year per 1000 people. The death rate has averaged 8 deaths per year per 1000 people. Thus, the population grew at a rate of 21 persons per year per 1000 people, or 2.1 percent (2.1 persons per 100 people).

The doubling time of a population indicates how long it will take, at the present rate of growth, before a particular population doubles its size. The populations of some cities and countries have doubled in 10 years. The population of Mexico City doubled between 1960 and 1970, and doubled again by 1980. The populations of entire countries, such as Honduras, Kenya, Syria, Iran, and Guatemala, are currently doubling in fewer than 30 years.

Doubling time can be used to illustrate the negative potential of uncontrolled population growth. For example, consider the need to double housing, food supplies, jobs, education, water, energy, and

### LINK

#### Social Studies

Most governments conduct a survey called a census every few years to determine the size of the population. Censuses were conducted in ancient Babylonia, Rome, and China. A census is conducted by the U.S. government every ten years to determine the age, sex, employment, and other data about the population. The information is used to determine such things as the number of representatives for each state in the House of Representatives.

**Table 13.1 Doubling Time of the Human Population**

Year	Approximate population size	Doubling time (in years)
8000 B.C.	5 million	1500
A.D. 1650	500 million	200
1850	1 billion	80
1930	2 billion	45
1975	4 billion	55
2030 (projected)	8 billion	

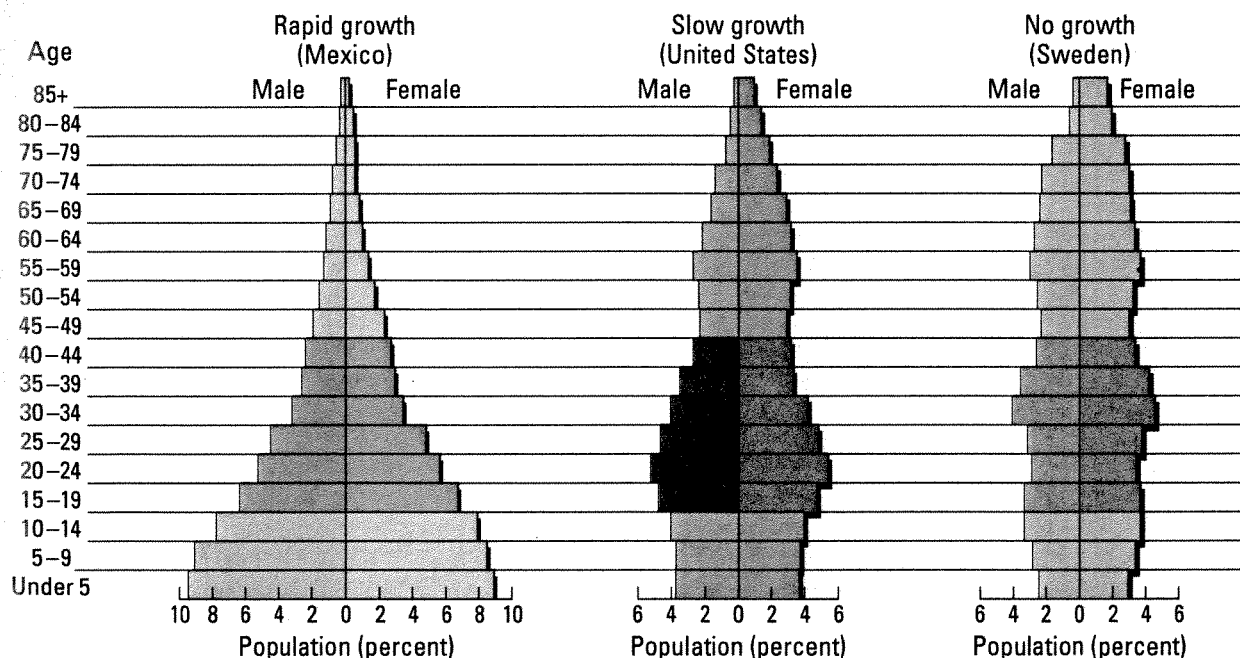
health facilities, just to maintain the present standard of living. Then consider the challenge of attempting to improve that standard of living in the same time period.

When measuring the growth rate of a specific population, births and deaths are not the only factors to be considered. Immigration and emigration can also affect the size of a population. Immigration is the movement of individuals into an area, while emigration is movement out of an area. When determining the size of the human population in a specific area such as a city or nation, the factors of immigration and emigration must be considered. When studying the size of the entire population of Earth, however, these factors do not apply. Humans cannot leave the planet, nor can newcomers arrive from elsewhere.

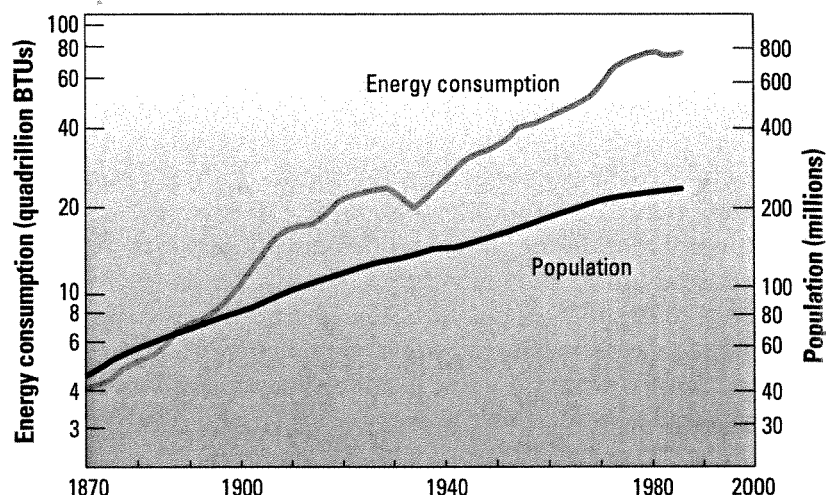
## Demography

When scientists, planners, and policy makers study populations, they need to know not only how many people there are, but also what types of people make up the population. By including such information in their studies, scientists can determine how the population is changing. Are people becoming older, richer, or better educated? Are they having more children? Are there more women than men? These questions can be answered by demographic studies. *The science of the changing vital statistics in a human population is called **demography** (de-MAH-gruh-fee).* Figure 13.3 shows the demographic statistics of population ages in three nations: one growing quickly (Mexico), one growing slowly (United States), and one that is not growing at all (Sweden). Notice how much younger

**Figure 13.3** These charts show the percentage of the population in each age group of three nations: one growing rapidly (Mexico), one growing slowly (U.S.), and one that is not growing at all (Sweden). The darkly shaded areas show people in their child-bearing years.



**Figure 13.4** During the 1900s, the energy consumption of the United States grew faster than the population. What do you think was the reason for the drop in energy use in the 1930s?



the population of Mexico is compared to Sweden. The information in these graphs is much more useful than a simple number showing population size. With the additional information, plans can be made to accommodate the future needs of society such as child care and care for the elderly.

## Changing Needs

It is not difficult to understand that a society with more people has greater needs than a society with fewer people. However, population size is not the only factor that determines the needs of a society. Changes in technology, lifestyles, and standards of living all affect the needs and consumption rates of a population. Notice the change in energy use during the period shown in Figure 13.4. The energy use far outpaced the population growth. Much of this change in usage was due to increased industrialization and modernization. Industrial societies generally use more resources than underdeveloped societies. As more nations of the world develop into industrialized nations, their needs can be expected to increase faster than the population increases. Ironically, it is the least developed nations of the world that are expected to experience the greatest increase in population during the coming decades.

## SECTION REVIEW

1. List four types of information that may be included in demographic studies.
2. What factors are considered when measuring population growth?
3. **Calculate** What is the percentage of population growth in a region if the number of people per 10 000 individuals increases by 330 each year?